

REMARKS

Claims 1-45 and 67-70 are pending. By this Amendment, claims 1 and 30 are amended and claims 67-70 are added.

Applicants thank Examiner Nguyen for the courtesies extended to Applicants' undersigned attorney at the July 3 interview. At the interview, Examiner Nguyen agreed that Applicants' arguments at least overcome the rejections based upon the Makinouchi and Ozawa references. Applicants have further amended claims 1 and 30 beyond what was discussed at the interview, in order to recite that at least one of aberrations of the imaging optical system are adjusted. In addition, Applicants add claims 67-70, which will be discussed below. Applicants' arguments made at the interview are set forth below.

Applicants note with appreciation the allowance of claims 14-27, 29 and 36-45. Applicants also note with appreciation the identification of allowable subject matter in dependent claims 3, 4, 32 and 33. Applicants respectfully submit that all pending claims are in condition for allowance for at least the reasons set forth below.

Claims 1, 2, 5-13, 28, 30, 31, 34 and 35 stand rejected under 35 U.S.C. §102(b) over U.S. Patent No. 5,677,754 to Makinouchi. This rejection is respectfully traversed.

The Office Action asserts that elements 6A, 6B, 7A, 7B and 8 of Makinouchi correspond to the claimed imaging optical system, and that elements 6A and 6B of Makinouchi correspond to the claimed adjusting unit. Applicants respectfully disagree.

Clearly elements 6A, 6B, 7A and 7B of Makinouchi correspond to the claimed illumination area defining unit because they function to define a predetermined area corresponding to an illumination area to be formed on a mask. See, for example, col. 5, lines 21-36 of Makinouchi.

Thus, only element 8 (relay lens system) of Makinouchi is an imaging optical system that is located between the illumination area defining unit and a mask, and that forms an

illumination area on the mask by projecting a predetermined area defined by the illumination area defining unit onto the mask. Because Makinouchi does not disclose or suggest any structure for adjusting the optical characteristic of relay lens system 8, Makinouchi does not disclose or suggest the claimed adjusting unit of claim 1 or the adjusting step of claim 30. Withdrawal of the rejection based upon Makinouchi is requested.

Claims 67-70 are patentable over Makinouchi for at least the same reasons.

Claims 1, 2, 5-13, 28, 30, 31, 34 and 35 stand rejected under 35 U.S.C. §102(e) over U.S. Patent No. 6,295,122 to Schultz et al. This rejection is respectfully traversed.

Schultz et al. does not disclose or suggest the claim 1 adjusting unit for correcting at least one of aberrations of said imaging optical system so as to improve an exposure characteristic in an overlapping exposure area formed on said photosensitive substrate as recited in independent claim 1, or the adjusting step of correcting at least one of aberrations of said imaging optical system prior to said exposure step so as to improve an exposure characteristic in an overlapping exposure area formed on said photosensitive substrate as recited in independent claim 30. Schultz et al. discloses correction of un-uniformity in illumination (i.e., unevenness of illumination distribution) on a reticle 33 and wafer 500 by moving a lens 301 of imaging optical system 300. See, for example, col. 3, lines 1-12 and lines 21-26. Schultz et al. performs this correction in response to changes of the illumination condition (e.g., changes in the numerical aperture and/or the shape of the aperture between circle, ring or quadrupole) caused by movement of a zooming lens 71 and an axicon 72. See, for example, col. 1, line 66 - col. 2, line 5 and col. 2, lines 13-17.

Schultz et al. does not teach or suggest performing overlapping exposure, and does not teach or suggest correcting at least one of aberrations of the imaging optical system that would improve an exposure characteristic in an overlapping exposure area formed on the substrate as recited in claims 1 and 30. In fact, the corrections performed by Schultz et al.

may actually cause degradation of the imaging characteristics of the imaging optical system, which would worsen the exposure characteristic in an overlapping exposure area formed on the substrate.

As described in Applicants' specification, the adjusting unit/step of claims 1 and 30 corrects at least one of aberrations of the imaging optical system so as to improve the exposure characteristic in an overlapping exposure area on the substrate, and thereby lowers an unevenness in the amount of exposure in overlapping exposure parts of the image. See, for example, page 5, line 3 - page 6, line 4, page 7, lines 2-6, page 19, line 6 - page 20, line 22 and page 41, line 5 - page 45, line 13. Schultz et al. does not recognize or address this problem. Withdrawal of the rejection based upon Schultz et al. is requested.

Schultz et al. also does not disclose or suggest the first and second adjusting units of claim 67, or the first and second adjusting steps of claim 68. Thus, claims 67-70 are patentable over Schultz et al.

Claims 1, 2, 5-13, 28, 30, 31, 34 and 35 stand rejected under 35 U.S.C. §102(e) over U.S. Patent No. 6,501,535 to Ozawa. This rejection is respectfully traversed.

The Office Action asserts that elements 9A and 9B of Ozawa correspond to the claimed imaging optical system, and that element 17 of Ozawa corresponds to the claimed adjusting unit. Applicants respectfully disagree.

Clearly, field stop 9A and variable field stop 9B of Ozawa are parts of the illumination area defining unit because they define a predetermined area corresponding to an illumination area to be formed on a mask. See, for example, column 6, lines 49-63 of Ozawa.

Elements 8B and 10 of Ozawa are an imaging optical system that is located between an illumination area defining unit and a mask, and that forms an illumination area on the mask by projecting the predetermined area defined by the field stops 9A, 9B onto the mask. Because Ozawa does not disclose or suggest adjusting relay lens 8B or condenser lens 10, or

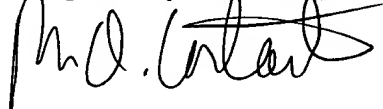
the optical system defined by these lenses, Ozawa does not disclose or suggest the adjusting unit of claim 1 or the adjusting step of claim 30. Accordingly, withdrawal of the rejection based upon Ozawa is requested.

Claims 67-70 are patentable over Ozawa for at least the same reasons.

In view of the foregoing, Applicants respectfully submit that this application is in condition for allowance. Favorable reconsideration and prompt allowance are earnestly solicited.

Should the Examiner believe anything further would be desirable to place this application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

Respectfully submitted,



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MAC/jam

Enclosure:

Request for Continued Examination

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